



EOSDIS

NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

Earthdata Search Usability Study Process

Summer ESIP 2016

Mark Reese

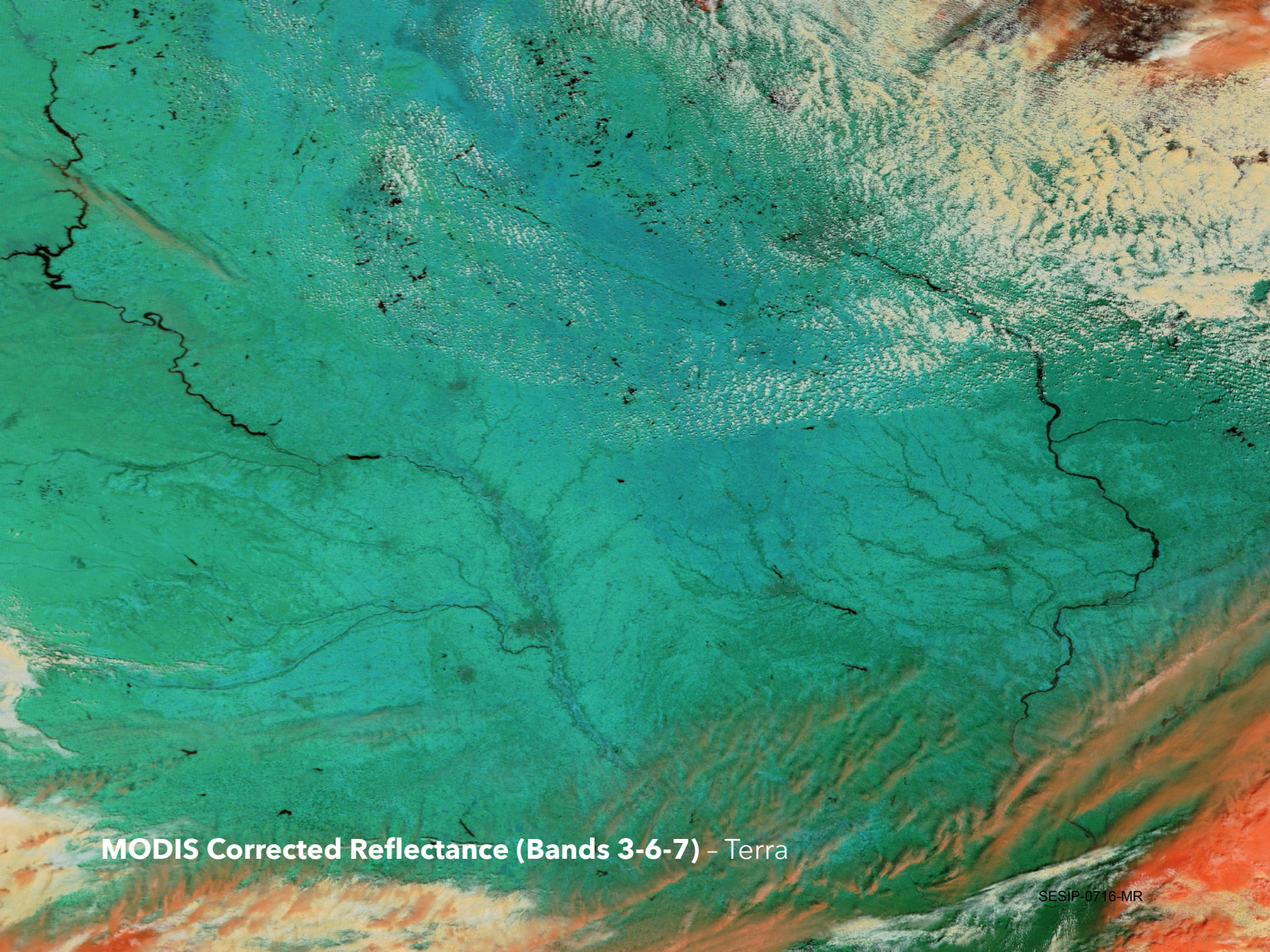
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SESIP-0716-MR



EARTHDATA SEARCH • SIOUX FALLS • APRIL 11 & 12, 2016

LP DAAC Spring User Study



MODIS Corrected Reflectance (Bands 3-6-7) – Terra

SESIP-0716-MR

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User Study Overview

Earthdata Search

NASA (National Aeronautics and Space Administration) [US] https://search.earthdata.nasa.gov/search/granules?p=C185174201-USGS_EROS&g=G185286611-USGS_EROS&m=34.611328125!-113.115234375!

EARTHDATA Search

Landsat TIRS

Temporal Spatial Clear Filters

Feedback Earthdata Login

Back to Collections

Landsat 8 Operational Land Imager (OLI)_Thermal Infrared Sensor (TIRS) Pre-WRS-2 V1

Retrieve Collection Data

Showing 40 of 9616 matching granules

Sort by: Start Date, Newest first

Search Time: 0.3s Report a metadata problem

LC80340392013100LGN01
2013-04-10T17:50:40Z to 2013-04-10T17:51:10Z

LC80340382013100LGN01
2013-04-10T17:50:16Z to 2013-04-10T17:50:46Z

LC80340372013100LGN01
2013-04-10T17:49:53Z to 2013-04-10T17:50:22Z

LC80340362013100LGN01
2013-04-10T17:49:29Z to 2013-04-10T17:49:58Z

LC80340352013100LGN01
2013-04-10T17:49:05Z to 2013-04-10T17:49:35Z

2013-04-10T17:50:40Z to 2013-04-10T17:51:10Z

MONTH

Landsat 8 Operational Land Imager (OLI)_Thermal Infrared Sensor (TIRS) Pre-WRS-2 V1

May Jun Jul Aug Sep Oct Nov Dec Jan 2016 Feb Mar Apr

v 1.16.4 • NASA Official: Andrew Mitchell • FOIA • NASA Privacy Policy • USA.gov

Earthdata Access: A Section 508 accessible alternative

Landsat TIRS Granules – Earthdata Search

Our goal was to answer the following questions:

- 1 What are the key difficulties that people encounter when visiting the site?
- 2 How important is discoverability and relevance, given the way people typically search?
- 3 At what point do the map and timeline become useful?
At what point are they in the way?
- 4 Is the "Download All" paradigm sufficient , or is a positive selection (shopping cart) mechanism necessary?

Our Method



Survey



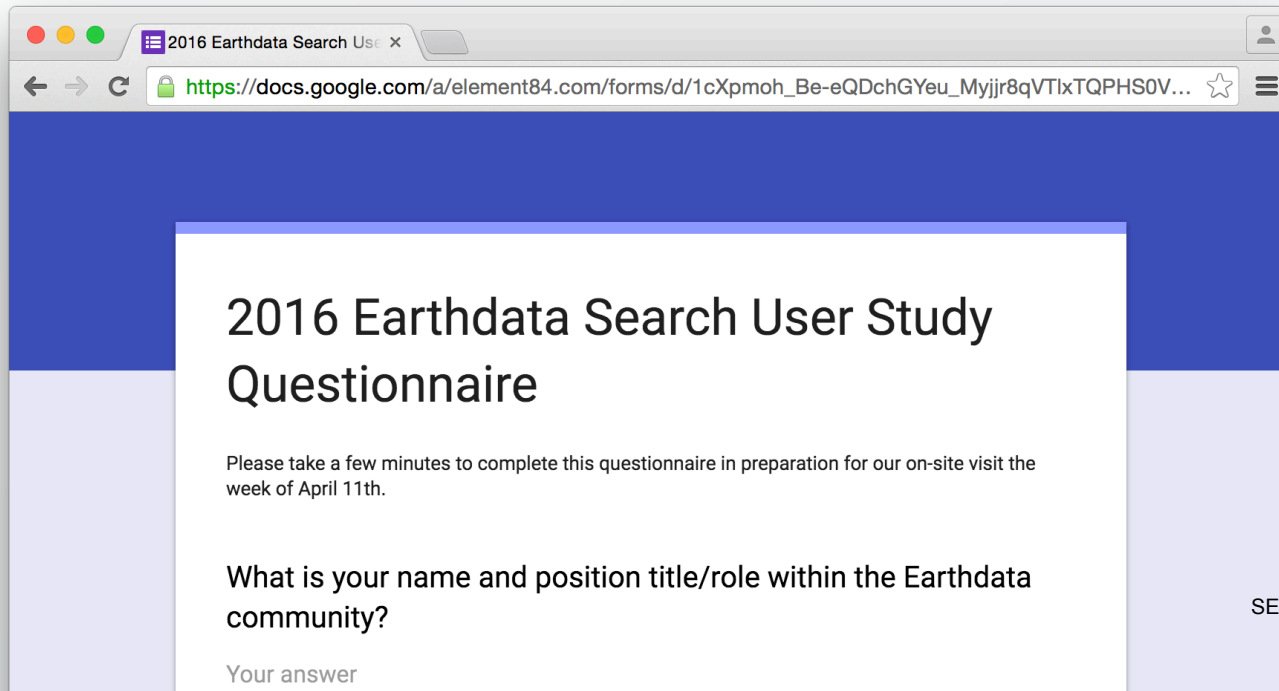
Tasks &
Questions



Analysis

Initial Questionnaire

Before the in-person user study, each participant was asked to complete a short survey about their work at LPDAAC and familiarity with Earthdata Search.



The image shows a screenshot of a web browser displaying a Google Forms questionnaire. The browser's address bar shows the URL: https://docs.google.com/a/element84.com/forms/d/1cXpmoh_Be-eQDchGYeu_Myjr8qVTlxTQPHS0V.... The questionnaire title is "2016 Earthdata Search User Study Questionnaire". Below the title, there is a paragraph: "Please take a few minutes to complete this questionnaire in preparation for our on-site visit the week of April 11th." The first question is "What is your name and position title/role within the Earthdata community?". Below the question, there is a text input field with the placeholder text "Your answer".

2016 Earthdata Search User Study
Questionnaire

Please take a few minutes to complete this questionnaire in preparation for our on-site visit the week of April 11th.

What is your name and position title/role within the Earthdata community?

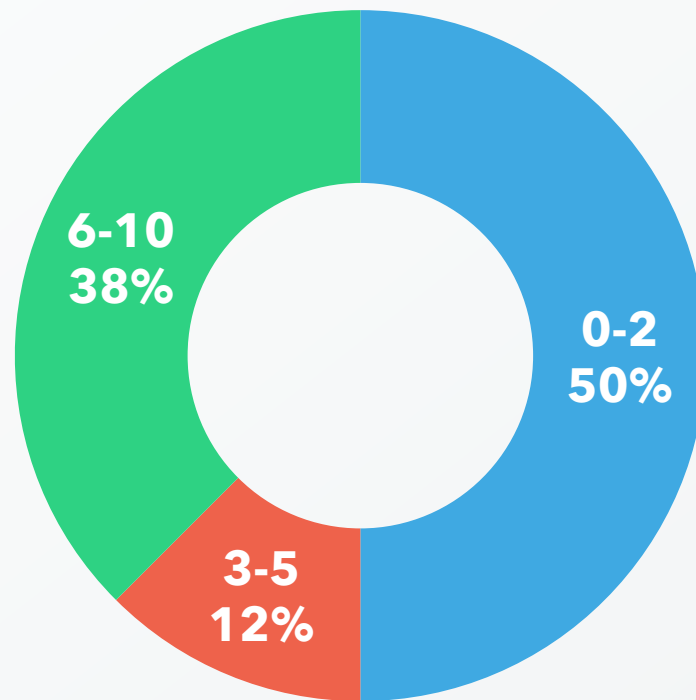
Your answer



Questionnaire Results

Week Usage Rates

How many **hours each week** do you spend with these applications?



Search & Discovery Pain Points

- ❖ Searching adjacent path and rows by date, sensor or quality for multi-decade time series.
- ❖ Removing several scenes quickly and accidentally clicking on the retrieve button. The interface often does not keep up with the user.
- ❖ Flexibility and use of KML and Shapefile searches.
- ❖ Lack of instructions and tutorials for new users.
- ❖ Identifying cloud-free scenes.
- ❖ Slow redraw/pan/zoom.
- ❖ Learning curve for new users.

Our Method



Survey



Tasks &
Questions



Analysis

User Tasks

- 1 Find a data collection hosted at LPDAAC that has map imagery and view the latest imagery over the continental US.
- 2 Find and download all Landsat 8 TIRS images from January of this year which cover Sioux Falls and have no clouds.
- 3 Find an example of ASTER and Landsat 7 data files collected within an hour of one another over Sioux Falls.
- 4 Use the client to find and retrieve data which may be relevant to your work.

Notes

The image shows three overlapping browser windows displaying the Earthdata Wiki page for "April LP DAAC Notes" by Patrick Quinn. The URL in all windows is <https://wiki.earthdata.nasa.gov/display/EDSC/April+LP+DAAC+Notes%3A+Patrick+Quinn>.

Window 1 (Left): Summary

Summary

We received a large number of actionable items and technical support requests that we were able to address.

Most Prominent Issues

1. Facet query results for collections
2. Collection search results
3. Ability to choose a collection
4. "Collection" button not working
5. Discovering new data to view its details
6. Timeline interface for figuring out data

Note: The first 4 items were made for sure, but the last 2 are still in progress.

Top features

1. Eye icon. Place or find
2. Alerts. The
3. Top hat. It

Window 2 (Middle): Findings

Findings

Category	Finding
Keyword Search	Expected placename search of "conterminous us" to work twice
Temporal	Left temporal box open
Collections	Eye icon not behaving as expected
Granule Results	User could not find granule results
Earthdata Login	User needed to reset password for access
Map	User unclear as to why granules which do have map imagery in reality (Landsat) did not have "Map Imagery"

Window 3 (Right): Estimated Task Completion Times

Estimated Task Completion Times

Participant	Task 1	Task 2	Task 3	Task 4
Josh	10:00	10:00	15:00	06:00
Brian	NA*	12:00	NA	NA
Jennifer	9:00	DNF	NA	10:00**
Carolyn	04:00	11:00	27:00**	NA
Danielle	01:00	03:00	02:00	NA
Rynn	07:00	05:00	13:00	06:00
Ben	01:00	06:00	04:00	05:00**
Bruce	15:00	08:00	NA	10:00
Kelly	05:00	06:00	05:00	NA
Mark***				

* Earthdata went down
** No ending time noted, needs video review/confirmation
*** Mark is on the Earthdata development team, not a member of LP DAAC

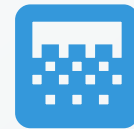
Our Method



Survey



Tasks &
Questions



Analysis

Findings & Recommendations



Metadata Quality

Facet Quality

Users were overwhelmed by the number of facets, while simultaneously not being able to find key facets corresponding to high-value collections. This issue comes up because we only show the top 50 collections by count.

Keywords		
AGRICULTURE		1895
ATMOSPHERE		7359
ATMOSPHERE-BIOSPHERE INT...		1
BIOLOGICAL CLASSIFICATION		4184
BIOMASS		1
BIOOSPHERE		2
BIOSPHERE		6922
CLIMATE INDICATORS		553
CRYOSPHERE		2947
HUMAN DIMENSIONS		3872
HYDROSPHERE		99
LAND SURFACE		5313
OCEANS	SESIP-0716-MR	10451

Facet Quality

Where is Landsat 8?

LABORATORY	691
LANDSAT	277
LANDSAT-5	206
LANDSAT-7	186
MAPS	353
METEOROLOGICAL STATIONS	395

Bioosphere?

BIOMASS	1
BIOOSPHERE	2
BIOSPHERE	6922
CLIMATE INDICATORS	553
CRYOSPHERE	2947
HUMAN DIMENSIONS	3872

Collections

Search Relevance

Clear-cut, highly-specific searches do not turn up what users need as the top result. Less specific searches fare worse.

The screenshot displays the Earthdata Search web application. The browser address bar shows the URL: <https://search.earthdata.nasa.gov/search?m=-0.14062510.14062510!1!0!&q=Landsat>. The search bar contains the text "Landsat". The interface shows 649 matching collections. The left sidebar lists various features and filters, including "Map Imagery", "Near Real Time", "Subsetting Services", "Keywords", "Project", "2D Coordinate Name", "Processing level", "Organization", and "Platform". The main content area displays three collection results:

- BOREAS RSS-07 Landsat TM LAI Images of the SSA and NSA**
doi:10.3334/ORNLDAAC/441 v1 - ORNL_DAAC
1991-06-06 to 1994-06-09 | 7 Granules
- Satellite Landsat TM Extr. Data (FIFE)**
doi:10.3334/ORNLDAAC/78 v1 - ORNL_DAAC
1987-04-09 to 1988-09-26 | 13 Granules
- BOREAS Follow-On DSP-01 Landsat TM Land Cover Mosaic of the BOREAS Transect**
doi:10.3334/ORNLDAAC/588 v1 - ORNL_DAAC
1991-08-09 to 1998-08-28 | 2 Granules

Each result includes a "No image available" placeholder and icons for viewing, information, and adding to a project. A satellite map of the region is visible on the right side of the interface.

Collections

Search Relevance

Searching for *landsat*: the 28th result is the first major Landsat collection (Landsat 7 ETM+)

Searching for *sea ice*: mostly outdated collections at the top, collection-only with limited geographic scope

Searching for *modis*: the main LPDAAC and NSIDC collections are nowhere to be found in the first several pages of results, except for the two we artificially boost

Collections

Collection Visibility

Searches often produce many results which appear very similar to one another with the fields we are able to surface. Choosing the correct one is difficult, and poor relevance makes it even trickier.



No image
available

AfSIS MODIS Collection: Albed

CIESIN_AfSIS_MODIS_ALB2012 v2012.00 - C

2000-02-01 to 2012-06-30 | Collection on



No image
available

AfSIS MODIS Collection: Land

CIESIN_AfSIS_MODIS_LCT2012 v2012.00 - C

2001-01-01 to 2009-12-31 | Collection on



No image
available

AfSIS MODIS Collection: Leaf A

CIESIN_AfSIS_MODIS_LAIFPAR2012 v2012.0

2000-02-01 to 2012-06-30 | Collection on



No image
available

AfSIS MODIS Collection: Land Release

CIESIN_AfSIS_MODIS_LST201404 v2014.04

2002-07-01 to 2014-03-31 | Collection on



No image
available

AfSIS MODIS Collection: Prima

CIESIN_AfSIS_MODIS_PP2012 v2014.00 - CI

2000-01-01 to 2010-12-31 | Collection on



No image
available

AfSIS MODIS Collection: Veget

CIESIN_AfSIS_MODIS_VEGIN201404 v2014.0

2000-02-01 to 2014-03-31 | Collection on

Collection Recommendation

- Improve Quality
 - Facet helper
- Improve Relevancy
 - Based on version id (and other small wins)
 - Based on “has granules”
 - Relevancy ordering for facet searches
- Surfacing information that helps quickly distinguish collections from one another (map in preview image, file formats, abstract, etc...)

Next Steps

Summary: Short Term Plans

- Low hanging fruit
- Redesign Collection & Granule screens
- Reimagine Timeline

Summary: Long Term Plans

- Address metadata quality issues
- Revisit the core user and personas profiles
- My Earthdata Search™?
- Earthdata Search Lite™?



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